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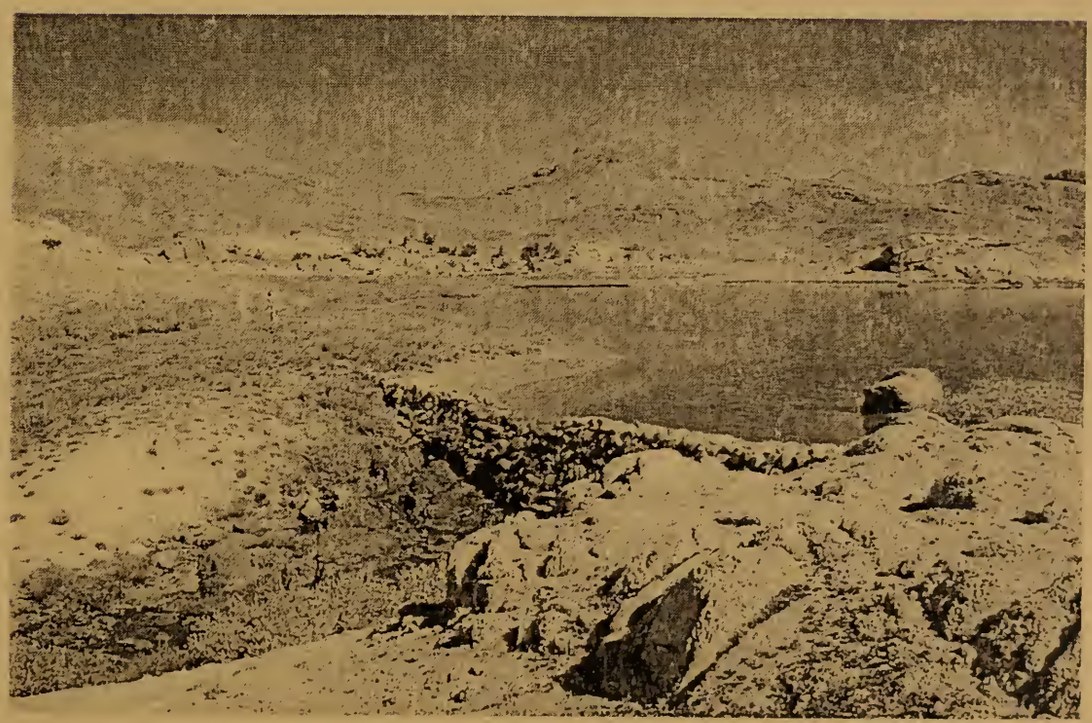
September 2003

Draft Environmental Impact Statement

Emigrant Wilderness Dams Summary

Stanislaus National Forest
Summit Ranger District
Tuolumne County, California



Emigrant Wilderness Dams
Draft Environmental Impact Statement Summary

Stanislaus National Forest
Summit Ranger District
Tuolumne County, California

Lead Agency: USDA Forest Service

Responsible Official: Tom Quinn, Forest Supervisor
Stanislaus National Forest
19777 Greenley Road
Sonora, CA 95370
(209) 532-3671

Information Contact: John J. Maschi, Forest Planner
Stanislaus National Forest
19777 Greenley Road
Sonora, CA 95370
(209) 532-3671

Abstract

The Stanislaus National Forest proposes to reconstruct, repair, maintain, and operate 12 dams in the Emigrant Wilderness. The Forest also proposes not to maintain six dams that would be allowed to deteriorate naturally. The 12 dams are: Snow, Bigelow, Huckleberry, High Emigrant, Emigrant Meadow, Emigrant Lake, Cow, Leighton, Long, Lower Buck, and Y-Meadow. The six dams include Horse Meadow, Red Can, Yellowhammer, Bear, Cooper, and Whitesides. The draft EIS also assesses the potential impacts of two alternative scenarios. Alternative 2 (No Action) allows all 18 dams to deteriorate naturally. Alternative 3 emphasizes the repair and maintenance of the seven dams eligible for inclusion on the National Register of Historic Places. The seven dams are Bigelow, Emigrant Meadow, Emigrant Lake, Red Can, Leighton, Long, and Lower Buck. The remaining eleven dams would be allowed to deteriorate naturally under Alternative 3. Alternative 1 is the preferred alternative.

Mail Comments to: Stanislaus National Forest
Attn: Emigrant Dams
19777 Greenley Road
Sonora, CA 95370

E-mail Comments to: comments-pacificsouthwest-stanislaus@fs.fed.us [Subject: Emigrant Dams]

Comments Must Be Received: **45 day comment period starts the day after the Environmental Protection Agency publishes a Notice of Availability for the draft EIS in the Federal Register, expected on September 8, 2003.**

Reviewers should provide the Forest Service with their comments during the review period of the draft environmental impact statement. This will enable the Forest Service to analyze and respond to the comments at one time and to use information acquired in the preparation of the final environmental impact statement, thus avoiding undue delay in the decision making process. Reviewers have an obligation to structure their participation in the National Environmental Policy Act process so that it is meaningful and alerts the agency to the reviewers' position and contentions. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 553 (1978). Environmental objections that could have been raised at the draft stage may be waived if not raised until after completion of the final environmental impact statement. City of Angoon v. Hodel (9th Circuit, l986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Comments on the draft environmental impact statement should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 CFR 1503.3).

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Tables and Figures

Chapter 1 – Purpose of and Need for Action

BACKGROUND

The Wilderness Act of 1964 established the National Wilderness Preservation System "to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." On January 3, 1975, Public Law 93-632 (Section 2(b)) designated 106,988 acres as Emigrant Wilderness. At that time, 18 water control structures existed and their presence was recognized in the Congressional Record. On September 28, 1984, Public law 98-425 designated an additional 6,100 acres as part of the Emigrant Wilderness. Congress, which often includes what the disposition of non-conforming structures and uses should be, did not address the Emigrant Wilderness dams in either Act.

The Emigrant Wilderness contains over 100 named lakes[1] (77 of which have been historically stocked with trout) which is one of the highest ratios of lakes per wilderness unit in the Sierra Nevada. Of the original 18 water control structures, 15 are associated with lakes. All of these, with the exception of Y-Meadow, impound water on naturally existing lakes. Y-Meadow inundated an existing stream and riparian habitat to create a new lake. Three types of dams exist in the Emigrant Wilderness. Streamflow augmentation dams (12): Snow Lake Dam, Bigelow Lake Dam, Huckleberry Lake Dam, High Emigrant Lake Dam, Emigrant Meadow Lake Dam, Middle Emigrant Lake Dam, Emigrant Lake Dam, Leighton Lake Dam, Long Lake Dam, Lower Buck Lake Dam, Y-Meadow Lake Dam, Bear Lake Dam. Lake level dams (3): Cow Meadow Dam, Red Can Dam, Yellowhammer Dam. Meadow maintenance dams (3): Horse Meadow Dam, Cooper Meadow Dam, Whitesides Meadow Dam

LOCATION

The Emigrant Wilderness borders include Yosemite National Park on the south, the Toiyabe National Forest on the east, and State Highway 108 on the north. The Emigrant Wilderness is an elongated area that trends northeast about 25 miles in length and up to 15 miles in width. Watersheds drain to the Stanislaus and Tuolumne rivers. The Wilderness is entirely within Tuolumne County (Figure S-1).

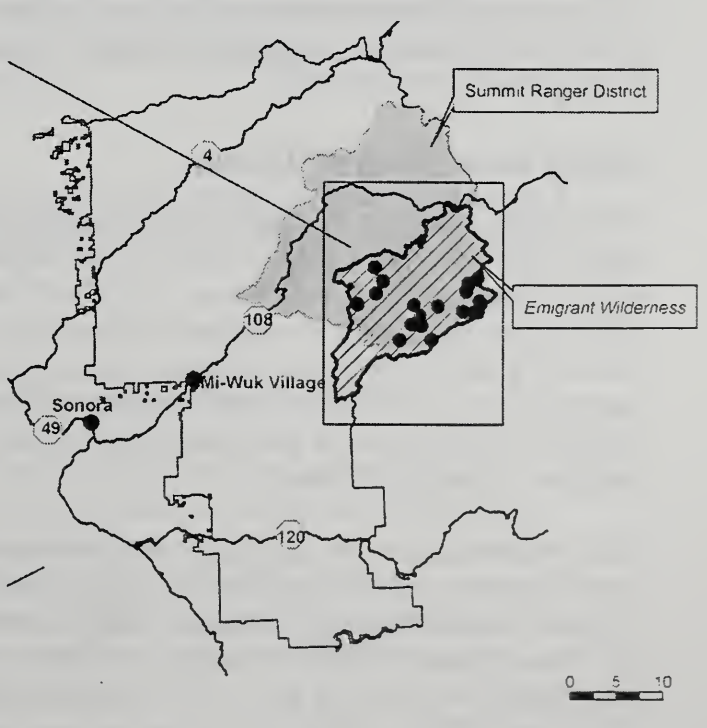

Figure S-1 Vicinity Map

PURPOSE AND NEED FOR ACTION

The Forest Service needs to make a final decision on maintaining or not maintaining 18 dams. The following items contribute to generating the purpose and need (why here

[1] The Emigrant Wilderness contains over 500 small, unnamed lakes.

and why now) for the proposed action to maintain 12 and not maintain 6 dams:

1. Controversy
2. Planning History
3. Social/Cultural Values
4. Forest Plan Direction
5. California Department of Fish and Game (CDFG)/Forest Service Joint Strategy

Controversy

Controversy surrounding management of the Emigrant Wilderness dams resulted in recent Congressional consideration of legislation related to the Emigrant dams. No specific legislation has been enacted. The Forest Service has conducted several planning efforts related to the disposition of the dams since designation of the Emigrant as Wilderness. Public and legislative requests have been received to maintain, repair, and operate twelve of the dams. No maintenance has occurred since 1989 due to appeal decisions on previous planning efforts. There is a need to resolve this continuing controversy.

Planning History

In 1931, the Forest Service designated this area for primitive management as the Emigrant Basin Primitive Area. At this time, the Forest Service policy for Primitive area designation focused on highest public use. Areas set aside as “Primitive” were done so because of "recognition of the appeal and benefits to the public seeking such environments for recreation." Following legislative designation as a Wilderness in 1975, an "Emigrant Wilderness Management Plan", prepared in 1979, contained a requirement for a study to determine "...the condition, value and cost-effectiveness of the various [water control structures] as well as their effects on the natural hydrological processes."

The Emigrant Wilderness Management Direction (April 2002) presents the current Management Direction for the Emigrant Wilderness, based on the Forest Plan Amendment as modified through the appeal process. There is a need for site-specific direction for management of the dams.

Social and Cultural Values

Prior to fish stocking by cattlemen in the Emigrant area during the 1890s, high elevation lakes were naturally fishless. Most of the water control structures in the Emigrant Wilderness were constructed in the 1920s and 1930s to develop a resident fishery. The original intent of most of the dams was to augment downstream flows for fish habitat enhancement. The remaining water control structures were built as late as 1951. These dams are composed mostly of rock and mortar (with the exception of one earth-fill dam). Because of the age, condition, and historical associations of some dams, seven are eligible for the National Register of Historic Places.

Early maintenance and operation of the dams appears to have been shared primarily by the Forest Service, CDFG, sportsmen’s clubs, and other groups. In an October 1956 article in Outdoor California, it is mentioned that a maintenance inspection trip included officials from the Forest Service, CDFG, California State Chamber of Commerce, and the Sierra Club. The Forest Service and the CDFG shared maintenance of the Emigrant dams during the 1970s and 1980s. CDFG had a special use permit for the maintenance and operation of 11

dams[1] from 1965 through 1988. Due to budget and resource limitations, CDFG did not renew the permit after 1988. Operation of the streamflow releases has been done primarily by CDFG. Specific lake-by-lake fisheries management decisions are made between the Stanislaus National Forest and CDFG through a local Memorandum of Understanding.

There is a need to address social and cultural values associated with recreational fisheries and historical resources.

Forest Plan Direction

The following sections list applicable Forest Goals, Management Emphases, and Standards and Guidelines from the current Forest Plan.

Forest Goals

Manage Wilderness to preserve its character and values and to allow recreational, scenic, scientific, educational, conservation and historic uses consistent with these objectives.

Within the Emigrant Wilderness:

- Maintain and perpetuate the enduring resource of wilderness as one of the multiple uses of National Forest System land.
- Maintain wilderness in such a manner that ecosystems are unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces.
- Minimize the impact of those kinds of uses and activities generally prohibited by the Wilderness Act, but specifically excepted by the Act or subsequent legislation.
- Protect and perpetuate wilderness character and public values including, but not limited to, opportunities for scientific study, education, solitude, physical and mental challenge and stimulation, inspiration, and primitive recreation experiences.
- Gather information and carry out research in a manner compatible with preserving the wilderness environment to increase understanding of wilderness ecology, wilderness uses, management opportunities, and visitor behavior.

Management Emphasis

Management emphasis, within the Emigrant Wilderness, is to ***move the Wilderness as a whole toward a more pristine condition*** by maintaining some areas and moving others to a more pristine Opportunity Class designation.

Standards and Guidelines

- Maintenance of water impoundment structures will be consistent with the USDA Forest Service/CDFG Joint Strategy.
- No maintenance activities will occur until site-specific analysis is completed and a determination is made as to whether the structure is necessary to meet the minimum requirements for the administration of the area as wilderness.
- Dams without a high enough value to warrant retention should be allowed to deteriorate naturally (no maintenance) consistent with FSM direction, rather than removed. If a safety concern dictates removal, conduct the appropriate level of analysis to determine removal method.

[1] Bigelow, Cow Meadow, Emigrant, Emigrant Meadow, High Emigrant, Huckleberry, Leighton, Long, Lower Buck, Middle Emigrant, and Snow dams.

There is a need to implement the Forest Plan.

CDFG/FS Joint Strategy

On November 8, 2000, the Regional Forester and the CDFG Director developed a joint strategy to work cooperatively on site-specific analysis and additional data collection for future management of the dams. It should be noted the Joint Strategy did not make a decision to maintain or not maintain dams, but it established a cooperative framework for future management decisions (Table S-1 below).

Table S-1 Summary of Joint Strategy

Maintenance may be Warranted Pending Site-specific Analysis		Additional Data Needed to Determine if Maintenance is Warranted	No Maintenance Needed for Fisheries
Long	Middle	High Emigrant	Yellowhammer
Lower Buck	Emigrant	Cow Meadow	Whitesides
Leighton	Emigrant	Snow	Horse Meadow
Emigrant	Bigelow	Y-Meadow	Bear
Meadow	Huckleberry		Cooper
			Red Can

There is a need to move forward on the Joint Strategy.

PROPOSED ACTION

The Stanislaus National Forest proposes to reconstruct[1], repair, operate, and maintain 12 dams in the Emigrant Wilderness. Because no special funding is expected for this project, implementation depends upon obtaining funds other than normal Forest Service appropriated dollars. Maintenance and repair work would be accomplished through appropriate third party authorizations such as volunteer agreements, special use permits, Memorandum of Agreements, etc.

The Forest also proposes not to maintain six dams. These dams would be allowed to deteriorate naturally in order to restore natural processes. Table S-2 provides a listing of the dams proposed to be maintained and not maintained, and identifies the initial maintenance activities.

[1] Cow Meadow's main dam is the only dam that would be reconstructed, as it no longer exists. The remainder of the document will not make a distinction between reconstruct and repair.

Table S-2 Summary of the Proposed Action

Dams[1]	Type[2]	Proposed Action		Initial Activities[3]
		Maintain	Not Maintain	
Cherry Creek Watershed – East Fork Cherry Creek				
Snow	SA	✓		Replace outlet slide-gate, control stem, control wheel, and sleeve outlet conduit. Seal mortar on upstream and downstream face.
Bigelow*	SA	✓		Replace slide-gate and frame, outlet valve, control shaft/wheel, and sleeve outlet conduit. Replace missing rocks. Seal mortar on upstream face.
Horse Meadow	MM		✓	None
Huckleberry	SA	✓		Replace outlet valve, control shaft/wheel, and sleeve outlet conduit. Replace missing rocks. Seal mortar on upstream face.
Cherry Creek Watershed – North Fork Cherry Creek				
High Emigrant	SA	✓		Replace outlet valve, control shaft/wheel, and sleeve outlet conduit. Rebuild outlet control works well shaft. Seal mortar on upstream face.
Emigrant Meadow*	SA	✓		Replace outlet valve. Replace control shaft/wheel. Insert plastic pipe into existing outlet conduit. Seal mortar on upstream face.
Middle Emigrant	SA	✓		Rebuild failed left side of dam. Insert plastic pipe into existing outlet conduit. Replace outlet valve. Seal mortar on upstream face.
Emigrant Lake*	SA	✓		Stabilize mortar downstream face of dam. Repair spillway dike. Seal mortar on upstream face.
Cow Meadow	LL	✓		Reconstruct entire main dam.
Cherry Creek Watershed – Middle Fork Cherry Creek				
Red Can*	LL		✓	None
Leighton*	SA	✓		Replace outlet valve, control shaft/wheel, and sleeve outlet conduit. Disassemble and rebuild dam. Construct control works well shaft. Seal mortar on upstream face.
Yellowhammer	LL		✓	None
Cherry Creek Watershed – West Fork Cherry Creek				
Long*	SA	✓		Replace outlet valve, control shaft/wheel, and sleeve outlet conduit. Repair control works well shaft. Seal mortar on upstream face.
Lower Buck*	SA	✓		Replace outlet valve, control shaft/wheel, and sleeve outlet conduit. Log removal. Seal mortar on upstream face.
Clavey River Watershed – Lily Creek				
Y-Meadow	SA	✓		Replace outlet valve, control shaft/wheel, and sleeve outlet conduit. Seal mortar on upstream face.
Bear	SA		✓	None
South Fork Stanislaus River Watershed – South Fork Stanislaus River				
Cooper Meadow	MM		✓	None
Whitesides Meadow	MM		✓	None

[1] Dams marked with an asterisk are eligible for the National Register of Historic Places.
[2] SA – Streamflow Augmentation, MM – Meadow Maintenance, LL – Lake Level
[3] Repairs on dams eligible to the NRHP would follow the Secretary of the Interiors Standards for Treatment of Historic Properties 36 CFR 68. Repair or replacement materials would be in-kind when possible. Plastic pipe used as a conduit insert would be unseen and of black material which blends into the background.

DECISION FRAMEWORK

Decision to be Made

Given the purpose and need, the deciding official reviews the proposed action, the other alternatives, and the environmental consequences in order to decide which dams shall be maintained and which shall be allowed to deteriorate naturally. The responsible official may decide to: (1) select the proposed action, (2) select one of the alternatives, (3) select on of the alternatives after modifying the alternative with additional mitigating measures or combination of activities from other alternatives, or (4) select the no action alternative, choosing to take no action at this time.

Responsible Official

The Forest Supervisor for the Stanislaus National Forest is the Responsible Official who will decide what actions are to be implemented to either maintain or not maintain 18 dams in the Emigrant Wilderness. The Forest Supervisor will document decisions and rationale in a Record of Decision. The responsible official should consider the following questions when making the final decision:

- How well does it meet law, policy, and the Forest Plan?
- How well does it meet the "minimum necessary for the management of wilderness for wilderness purposes?"
- How well does it move the wilderness, as a whole, towards a more pristine condition?
- How well does it meet the FS/CDFG Joint Strategy?
- How well does it meet legislative intent?

Project Implementation

Once approved, project implementation could begin in the summer of 2004 as funding and participation from interested partners and volunteers develops.

PUBLIC INVOLVEMENT

In an effort to reach interested individuals and organizations, approximately 120 letters were mailed on January 31, 2003 to request comments on the Proposed Action. The Notice of Intent (NOI) was published in the Federal Register on February 3, 2003[1]. The NOI asked for public comment on the proposal through March 5, 2003, although comments were accepted well beyond that date. In addition, a press release was issued on February 7, 2003 regarding the Proposed Action and the comment period. Lastly, this project was published in the Forest's Schedule of Proposed Actions beginning with Issue 93 in December 2002, and has continued to be published in Issues 94 (March 2003), 95 (June 2003), and 96 (September 2003).

ISSUES

The Forest Service has separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already determined through law, regulation,

[1] Federal Register, Volume 68, Number 22, page 5267-5269.

Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; 4) conjectural and not supported by scientific or factual evidence; or 5) general comment. A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the project record. The Forest Service identified the following significant issues during scoping:

1. Natural Processes
2. Amphibians
3. Heritage Resources
4. Wilderness Character (Minimum Necessary)
5. Social and Economic

Chapter 2 – Alternatives, Including Proposed Action

Chapter 2 of the EIS presents the alternatives in comparative form, showing the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

ALTERNATIVES CONSIDERED IN DETAIL

Alternative 1 – Proposed Action

The Proposed Action includes the repair, maintenance, and operation of 12 dams in the Emigrant Wilderness. Six dams would not be maintained or operated and would be allowed to deteriorate naturally. See Table S-3

Alternative 2 – No Action

Under the No Action Alternative, no dams would be repaired, maintained, or operated. They would be allowed to deteriorate naturally over time. See Table S-3

Alternative 3 – Heritage

Alternative 3 includes the repair, maintenance, and operation of the seven dams that are eligible for inclusion on the National Register of Historic Places. Eleven dams would not be maintained or operated and would be allowed to deteriorate naturally. See Table S-3.

Alternatives Considered But Eliminated From Detailed Study

1. Maximize Amphibian Habitat Benefits
2. Restore Entire Dam System to Original Functional Levels
3. CDFG/FS Joint Strategy
4. Proposed Action plus Horse Meadow Dam
5. Proposed Action plus Horse Meadow and Yellowhammer Dams
6. Proposed Action minus Y-Meadow Dam
7. Proposed Action minus Y-Meadow and Leighton Dams
8. Proposed Action minus High Emigrant, Y-Meadow, Snow, and Cow Meadow

COMPARISON OF ALTERNATIVES

Table S-3 Comparison of Alternatives

Dams[1]	Alternative 1 Proposed Action		Alternative 2 No Action		Alternative 3 Heritage	
	Maintain	Not Maintained	Maintain	Not Maintained	Maintain	Not Maintained
Cherry Creek Watershed – East Fork Cherry Creek						
Snow	✓			✓		✓
Bigelow*	✓			✓	✓	
Horse Meadow		✓		✓		✓
Huckleberry	✓			✓		✓
Cherry Creek Watershed – North Fork Cherry Creek						
High Emigrant	✓			✓		✓
Emigrant Meadow*	✓			✓	✓	
Middle Emigrant	✓			✓		✓
Emigrant Lake*	✓			✓	✓	
Cow Meadow	✓			✓		✓
Cherry Creek Watershed – Middle Fork Cherry Creek						
Red Can*		✓		✓	✓	
Leighton*	✓			✓	✓	
Yellowhammer		✓		✓		✓
Cherry Creek Watershed – West Fork Cherry Creek						
Long*	✓			✓	✓	
Lower Buck*	✓			✓	✓	
Clavey River Watershed – Lily Creek						
Y-Meadow	✓			✓		✓
Bear		✓		✓		✓
South Fork Stanislaus River Watershed – South Fork Stanislaus River						
Cooper Meadow		✓		✓		✓
Whitesides Meadow		✓		✓		✓

[1] Dams marked with an asterisk are eligible for the National Register of Historic Places.

SUMMARY OF EFFECTS

Table S-4 Summary of Effects

	Resource Indicator	Alternative 1 Proposed Action	Alternative 2 No Action	Alternative 3 Heritage
Watershed	Cherry Creek Watershed			
	Restoration of hydrologic function, sediment transport, and hydrologic connectivity	Low	High	Moderate
	Potential riparian and meadow restoration (acres)	-14	+147	+48
	Clavey River Watershed			
	Restoration of hydrologic function, sediment transport, and hydrologic connectivity	Moderate	Moderate	Moderate
	Potential riparian and meadow restoration (acres)	+6	+6	+6
	South Fork Stanislaus Watershed			
	Restoration of hydrologic function, sediment transport, and hydrologic connectivity	High	High	High
	Potential riparian and meadow restoration (acres)	+3	+3	+3
Wilderness	**Huckleberry, Snow Lake**			
	Crowding	Opportunity for solitude decreases (short-term)	No Effects	No Effects
	Trails	Social trails may develop (short-term)		
	Bigelow			
	Crowding	Opportunity for solitude decreases (short-term)	No Effects	Opportunity for solitude decreases (short-term)
	Campsite and Stock Holding	Potential vegetation loss & site degradation (short-term)		Potential vegetation loss & site degradation (short-term)
	Trails	Social trails may develop (short-term) May effect secondary trail conditions (short-term)		Social trails may develop (short-term) May effect secondary trail conditions (short-term)
	High Emigrant			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	No Effects
	Campsite and Stock Holding	Potential vegetation loss & site degradation (short-term)		
	Trails	Social trails may develop (short-term)		
	Emigrant Meadow			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	Opportunity for solitude decreases (short-term)
	Middle Emigrant			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	No Effects
	Campsite and Stock Holding	Potential vegetation loss & site degradation (short-term)		
	Trails	Compaction to an undesignated use route. Rehabilitation may be ineffective		

	Resource Indicator	Alternative 1 Proposed Action	Alternative 2 No Action	Alternative 3 Heritage
	Emigrant			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	Opportunity for solitude decreases (short-term)
	Trails	Social trails may develop (short-term)		Social trails may develop (short-term)
	Cow Meadow			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	No Effects
	Campsite and Stock Holding	Potential vegetation loss & site degradation (short-term)		
	Leighton, Long			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	Opportunity for solitude decreases (short-term)
	Trails	Vegetation loss and compaction to the undesignated use route Existing trails may exceed trail standards		Vegetation loss and compaction to the undesignated use route Existing trails may exceed trail standards
	Lower Buck			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	Opportunity for solitude decreases (short-term)
	Trails	Access route would result in compaction and vegetation loss (short-term)		Access route would result in compaction and vegetation loss (short-term)
	Y-Meadow			
	Crowding	Opportunity for solitude decreases (short-term)	No effects	No effects
	Trails	Access route would result in compaction and vegetation loss (short-term)		
	All Other Dams	No effects	No effects	No effects
Heritage	Would there be an Adverse Effect under 36 CFR 800.5?	Yes, to 1 dam: Red Can dam	Yes, to 7 dams: Bigelow, Emigrant Meadow, Emigrant, Red Can, Leighton, Long, and Lower Buck	None
Wildlife	Federally Threatened – Bald Eagle	May affect but is not likely to adversely affect this species	No Effect	May affect but is not likely to adversely affect this species
	Region 5 Sensitive Species	May adversely impact individuals, but is not likely to result in a loss of viability, nor cause a trend to federal listing or a loss of species viability rangewide for Great gray owl, goshawk, mountain yellow-legged frog, and Yosemite toad	May have a beneficial impact on Great gray owl, mountain yellow-legged frog, Yosemite toad, pallid bat, and Townsend's big eared bat	May adversely impact individuals, but is not likely to result in a loss of viability, nor cause a trend to federal listing or a loss of species viability rangewide for Great gray owl, goshawk, mountain yellow-legged frog, and Yosemite toad

Chapter 3 – Affected Environment/Environmental Consequences

Chapter 3 of the EIS discusses the physical, biological, social, and economic environments of the projects area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2.

WATERSHED

The eighteen dams included in this analysis are located in three of the four watersheds contained in the Emigrant Wilderness. They are the South Fork Stanislaus River, the Clavey River, and the Cherry Creek watersheds. The three watersheds are part of two sub-basins (Tuolumne River and Stanislaus River) included in the San Joaquin River Basin that extends westerly from the crest of the Sierra Nevada to the crest of the Coast Range

Soils in the Emigrant Wilderness generally have low to moderate available water holding capacity, low mean annual soil temperature, and experience a short growing season. They are subject to high or very high erosion hazards on slopes greater than 30 percent, have low to moderate natural productivity, and in specific locations, have a seasonally high water table and are susceptible to compaction.

The Emigrant dam system alters the natural hydrologic regime and related ecological processes. It alters the timing and amount of seasonal streamflows, interrupts the sediment transport process, and changes the natural lake storage capacity.

Peak streamflows are modified by the dam system's additional lake storage capacity that holds water that would otherwise run off quickly during the snowmelt period. During the low flow period in late summer and early fall, streamflow augmentation increases the natural flow rate providing a more uniform flow rate rather than the natural flow which fluctuates more in response to summer rain and early fall storms.

At maximum pool elevation, the streamflow and lake level maintenance dams have increased the lake storage capacity by 4,230 acre-feet (from 11,455 acre-feet to 15,685 acre-feet) and have increased the lake surface area by 190 acres (from 565 acres to 755 acres). This results in seasonal flooding of riparian and terrestrial habitat adjacent to the lakes. Of the inundated acres, approximately 55 percent were former meadow habitat types, 15 percent were mesic types, and 30 percent are rock. Inundation of terrain type varies by lake. Some dams have reduced lakeside riparian and wet meadow habitat, while others have not changed the amount of these habitat types. Lakes with dams that result in seasonal inundation of potential lakeside riparian and/or wet meadow habitat are Snow, Huckleberry, High Emigrant, Emigrant Meadow, Middle Emigrant, Emigrant, Long, Y-Meadow, and Bear Lake.

Sediment transport through the stream system is important for meadow and stream bank soil replenishment and as an in-stream nutrient source for aquatic life. The dams act as sediment traps, storing sediments that would otherwise be transported downstream. This also results in an accelerated rate in the loss of lake storage capacity.

The dam system disrupts the natural timing, variability, and duration of floodplain inundation and water table elevation of lakes, streams, and meadows. Peak stream flows are modified by the dams' additional lake storage capacity that holds water that will otherwise run off quickly during the snowmelt period. During the low flow period in summer and early-mid fall, streamflow augmentation increases the natural flow rate, providing a more uniform flow rather than the natural flow that fluctuates more in response to summer and early fall rainfall events.

Dams have increased the storage volume and area impounded to approximately 135 percent of the natural values. The results are seasonal flooding of riparian habitat associated with lakes, streams, and natural meadows that have dams.

Lakeside riparian vegetation is less likely to survive where seasonal fluctuations in lake level occur due to the presence of a dam that is managed as a streamflow regulator (i.e., water is stored during half of the year and then gradually released during the remainder of the year). Lake level fluctuations for the Emigrant Wilderness dams range between 3 and 25 feet. Without dams, the natural lake level changes are much more subdued, allowing riparian vegetation to become established and survive in a more stable environment.

Dams interrupt the hydrologic connectivity between lakes, streams, and meadows by creating barriers to upstream or downstream passage for aquatic-dependent species.

WILDERNESS

An opportunity class (OC) represents an opportunity in wilderness based on a combination of social, resource, and management conditions. Opportunity classes, which range from I to IV, have been designated for every acre of the Emigrant Wilderness. In an OC I, the objective is to have natural processes operate with little to no human influence or impact. Opportunities for solitude in this OC would be outstanding as OC I represents the most pristine condition of wilderness. As the range progresses from OC I to IV, natural processes and the ecosystem still respond to natural processes; however, localized effects and influences from humans on natural processes and the ecosystem increase, and opportunities for solitude may be less as more interactions and encounters with others are anticipated. Each of the 18 dams being analyzed falls within OC II, III, or IV.

Standards and guidelines have been developed in the Stanislaus National Forest Plan for 20 management components (or prescriptions)[1] within the Emigrant Wilderness. Specific management direction for water developments and structures established opportunity class objectives. The four components listed below are used to analyze the effects of the alternatives on wilderness character and values and to determine how well they meet opportunity class objectives. Other management components have been analyzed through the Minimum Requirement Decision Guide (See project file, Stanislaus National Forest, Sonora, CA).

1. Crowding[2]
2. Campsite and stock holding area condition
3. Campfire wood and campfires

[1] Emigrant Wilderness Management Direction, Stanislaus National Forest, April 2002.

[2] In this section, crowding is being used to determine the opportunity for solitude and is not being used to evaluate the effects to the recreational experience.

4. Trails

Human influences and actions from the past 10 years have shaped the current condition of the Emigrant Wilderness in the East Fork Cherry Creek sub-watershed. These include trail construction, trail reconstruction and maintenance, dam maintenance and reconstruction, fish stocking, both commercial and general recreation use (and the subsequent development of campsites and use areas), snowtel site maintenance and repair, and the installation and repair of fencing to minimize the impacts of recreational stock. Cumulatively, these actions have determined the opportunity classes for these project destination areas. Restoration of dam structures, in addition to the continuation of the activities noted above, would provide for a continuous and higher degree of human influences.

Repair and maintenance of dams would not likely move a destination towards a more pristine condition. Because of Wilderness inventory and monitoring, those activities that could affect the Opportunity for Solitude and Wilderness character could be adjusted to comply with the OC standards and objectives. Cumulatively, there are some human influences that are more readily accepted than others are, such as trails and signing. The persistence of the dams in Wilderness would likely continue to diminish the wilderness experience for some visitors, while others would not be affected.

Allowing dam structures to deteriorate would reduce the degree of human influence. However, when considering the continuation of the activities noted above, the sub-watershed would continue to be affected by human influences.

VISUAL RESOURCES

Each of the eighteen dams is unique. Most are not a single dam, but a collection of structures that confine or retain flows. The visual impact of each dam is different depending on the terrain, size of the impoundment, size of the structure, materials incorporated in construction, and amount of current deterioration.

A naturally occurring straight line made by mineral deposits in standing water appears on rock faces, boulders, and the faces of dams near the lakes. The color intensity, shade, and hue on the surface vary from site to site depending on the mineral source and frequency/duration of periods between inundation and exposure to air. This condition occurs to some degree at all lakes in the Emigrant Wilderness, not only at the lakes impounded by dams. Active lake drawdown at dams over 7 feet[1] creates a wider band of surface mineral deposits (termed 'bathtub ring' in previous documents) than would have occurred naturally from evaporation and seasonal run-off.

The appearance of dam structures at 18 locations within the Emigrant Wilderness is viewed by many as being outside the accepted parameters for wilderness, particularly the "untouched by the hand of man" reference in the Wilderness Act. However, considering there are over 100 named lakes in this 112,000 acre wilderness, the impact is relatively small. It is within this scale that previous evaluations stated that the dams are "substantially unnoticeable." Yet, once the structures are seen, they tend to dominate the visual environment in the vicinity.

Negative impacts to scenery at some of the lakes from the alternatives would be caused by changes in the surface area of lakes from repair and maintenance activities, changes in the

[1] Snow, Bigelow, High Emigrant, Emigrant, Long, Lower Buck, Y-Meadow, Bear

condition of shorelines, and changes in the wide band of mineralized watermark on rock faces. Any dams that cease to be maintained would, in the long-term, become standing ruins. Generally, such ruins are perceived as an aspect of the cultural landscape in a Wilderness and the acceptance of that as a part of wilderness scenery varies from person to person.

Release of impounded water after dams are repaired and operational may draw down some lakes more than occurs under existing conditions. This would be particularly true of Long, Lower Buck, High Emigrant, Snow, and Bigelow. The changes in shoreline from lake storage at capacity to natural lake level would be noticeable because the exposed lake bottom would have no vegetation. This would occur late in the season (September-November) and because the magnitude of the draw down exceeds the similar effect of natural conditions at these high Sierra lakes, the scenery would be less appealing.

HERITAGE RESOURCES

All 18 dams were evaluated for eligibility against the National Historic Preservation Act (NHPA) criteria. The results of this evaluation found 7 of the 18 dams were determined significant and eligible for listing on the National Register of Historic Places (NRHP). The eligible dams are: Red Can, Leighton, Emigrant, Bigelow, Long, Emigrant Meadow, Lower Buck

Non-maintenance and natural deterioration of the seven National Register of Historic Places (NRHP) eligible dams would be considered an Adverse Effect. An Adverse Effect is an action or inaction that causes a property to lose those characteristics that qualify it for inclusion to the NRHP. Consultation and development of mitigation measures in an Memorandum of Agreement, prior to releasing this property from management, would be negotiated between the State Historic Preservation Office, Advisory Council on Historic Preservation and the Forest Service.

The loss of an eligible dam through natural deterioration would limit opportunities for on-site research and educational opportunities regarding the evolution of fish habitat improvement and of wilderness management. The long-term effect of non-maintenance and natural deterioration would be the irreversible loss of representative examples of Fred Leighton's contributions to early fisheries improvements.

The effects of repair and maintenance of eligible dams when done "in kind"[1] would be in keeping with the Secretary of the Interior's Standards for Treatment of Historic Properties (36 CFR 68) and would not effect the integrity or values that made the structures eligible for listing in the NRHP.

From the standpoint of the NHPA, there would be no effect to historic values of the 11 dams previously determined ineligible to the NRHP if they are maintained or not maintained. Because they are not eligible, they are not considered a "historic property" and, therefore; are not afforded further regulatory protections under section 106 of the NHPA. The age of the dams was only one aspect of the eligibility process. Although all of the dams are over 50 years old, only those dams with a direct association to Fred Leighton were determined significant for inclusion on the NRHP.

[1] Using materials the same or similar to the existing structure.

WILD AND SCENIC RIVERS

The Clavey River and its two tributaries have been determined suitable and have been recommended for Wild and Scenic River designation. The Clavey River begins at the confluence of Bell Creek and Lily Creek, approximately 4 miles southeast of Strawberry, California and drains into the Tuolumne River. The headwaters of Lily Creek consist of two forks, the western originating from Chewing Gum Lake and the eastern from Y-Meadow Lake, both within the Emigrant Wilderness. The headwaters of Bell Creek originate approximately 0.5 mile southeast of Burst Rock, also within the Emigrant Wilderness. The western headwaters of Lily Creek are located approximately 1 mile due east of the headwaters of Bell Creek.

The Clavey River is one of the longest remaining free-flowing streams in the Sierra Nevada. It is 47 miles from source to mouth and includes both headwater forks of Bell and Lily Creek. Lily Creek is within the project analysis area. Lily Creek, which is Segment 2 of the proposed Clavey Wild and Scenic River, is the water source for Bear Lake and is classified as "wild."[1] The portions of Lily Creek that are located above Y-Meadow dam are not eligible or suitable for Wild and Scenic River designation. However, Lily Creek is the water source for Y-Meadow. Whether an action would affect Lily Creek and threaten the eligibility and suitability of the Clavey has been evaluated in this document.

Alternative 1, which would manage and maintain Y-Meadow dam, would not threaten the wild and scenic attributes and eligibility of Lily Creek. The dams were present when the evaluation was completed on the Clavey River. The complete deterioration of the Bear Lake dams (200 to 500 years) would reduce the evidence of human development and enhance the free-flowing characteristics of Lily Creek. Although Alternative 1 does not support the wild and scenic attributes as much as Alternatives 2 and 3, it is not foreseen that the persistence of Y-Meadow Dam would, in the long term, affect the status of Lily Creek. Alternatives 2 and 3 would support the wild and scenic attributes of Lily Creek and the main Clavey more so than Alternative 1. With the gradual deterioration of both Y-Meadow and Bear Lake dams (it may take 20+ years), the evidence of human development would be reduced and the free-flowing characteristics of Lily Creek would be enhanced.

RECREATION

Currently, all of the Emigrant Wilderness is open to travel with stock. Packing with stock is a traditional activity in the Emigrant Wilderness. Sixteen percent of visitors to the Emigrant Wilderness come with stock. Seven of the ten most popular destination sites visited by private and outfitter/guide stock users are associated with lakes that have dams. Restrictions have been placed on two of the lakes with dams to reduce impacts from stock:

- Overnight stock holding is prohibited within ¼ mile of Bear Lake.
- No more than four animals per group can spend the night within ¼ mile of Long Lake.

These restrictions were imposed to protect the vegetation and soils around these popular destinations. Drift fences constructed to allow for turning stock loose to avoid damage caused when they are tied in one place are at Horse Meadow, Huckleberry Lake, and Cow Meadow Lake.

[1] Wild is defined as "free of impoundments; vestiges of primitive America with little or no evidence of human activity, and generally inaccessible except by trail with no roads, railroads, or provisions for vehicular travel" (1991, Stanislaus National Forest, Wild and Scenic Study, p. 28)

It is not known how many people go to the Emigrant Wilderness specifically to fish; however, it is thought to be a major attraction for many. The history and folklore associated with the system of dams built by Fred Leighton and others is very much a part of local tradition and is an important oral interpretive event. Local residents have a variety of beliefs concerning the dams, their construction, their importance to the fisheries and grazing, and the contribution made to the watershed. Regardless of the verity of these beliefs, they are a serious part of community relationship to the Emigrant Wilderness and the experience enjoyed by residents, especially those for whom it is a multigenerational event.

Recreational angling in the lakes and streams associated with the dams varies from non-existent to excellent. However, an important aspect of angling related to the dams is that the intent of these dams was not to augment lake fisheries, but to increase flow downstream to assist juvenile fish to make it back to the lakes for the winter. In some cases, impoundment reduces available spawning habitat by inundating the stream inlet on some of the lakes (as at Emigrant Lake).

The permit system has identified over 100 recreation destinations in the Emigrant Wilderness, 18 of these are sites associated with the dams. Among these 18, several of the lakes attract a notable percentage of the visitors (Emigrant, Huckleberry, and Long). Stock users have favorites among these sites as well. The existence of dams at these sites is not known to be a factor in visitation to individual sites, although the existence of the dams is known to be important to some visitors and to people in the local community because of their history. Visiting and camping near lakes in the Emigrant includes the potential for recreational trout fishing and the quality of the experience is dependent on conditions and populations of fish. Fish populations are likely to persist under each alternative through either self-sustaining reproduction or ongoing CDFG fish stocking. The specific event of repairing dams would potentially affect, to some degree, the opportunity for solitude and the overall wilderness experience of visitors for the duration of the staging and construction at those sites. Surface area of the lakes may be altered and the distance between lakeshore and popular camping locations may change, becoming closer to or farther from the shore.

The anticipated loss of carrying capacity from reduced lake size may affect fish size and condition, and potentially change fishing opportunities at some of the lakes. This can cause the pattern of use among all the lakes in the Emigrant Wilderness to be altered because some people may seek a better or alternate fishing environment elsewhere. This, added to generally increasing use of the Emigrant Wilderness could contribute to over-use of some lake areas.

WILDLIFE

Federally Threatened and Endangered Species

The analysis of federally endangered and threatened species has been documented in a separate Biological Analysis (BA). Below is a listing of the species that are known to occur or may occur in the project area. Forest Sensitive species are analyzed in a Biological Evaluation (BE). (The BA and BE are in the project file, Stanislaus National Forest, Sonora, CA.

The Bald Eagle, Haliaeetus leucocephalus, is discussed in the BA as a Federally Threatened species. Suitable nesting habitat does not occur within the Emigrant Wilderness. The lakes in the Emigrant Wilderness appear to be used only as summer foraging habitat for

resident birds. The primary bald eagle activity areas, determined by observations, appear to be centered chiefly on the Emigrant Lake area, although sightings have also been made at Deer Lake, Snow Lake, and Relief Reservoir. Human activity around these lakes may cause an eagle to flush from a perch or cease hunting activity in the proximity of people. Snow Lake and Emigrant Lake dams are being proposed for repair and maintenance. This activity is expected to cause little disturbance to the eagle. Repair of the dams may be beneficial to the fish population in the lake, as the eagle uses fish as a prey base.

Forest Service Sensitive Species

It was determined in the BE that the following Sensitive species may occur in the Project Area: Mountain yellow-legged frog, Yosemite toad, great gray owl, Northern goshawk, wolverine, Pacific fisher, Sierra Nevada red fox, American marten, Pallid bat, Townsend's big-eared bat, and peregrine falcon.

Surveys have indicated that mountain yellow-legged frog (MYLF) is closely associated in or near the following lakes and watersheds where management actions are proposed: Huckleberry Lake, Snow Lake, Cow Meadow Lake, Emigrant Lake, Middle Emigrant Lake, Long Lake, Lower Buck Lake, Y-Meadow Lake, Cooper Meadow, Horse Meadow. The MYLF is proposed for protection through the Endangered Species Act, but has been precluded at this time by the need to take other listing actions of higher priority (USFWS, January 16, 2003).

Surveys have indicated that Yosemite Toad (YT) is closely associated in or near the following lakes and watersheds where management actions are proposed: Emigrant Meadow Lake, High Emigrant Lake, Snow Lake, Middle Emigrant Lake, Emigrant Lake, Whitesides Meadow. YT had been proposed for protection under the Endangered Species Act, but that listing is precluded at this time because of budgetary constraints (USFW, 12-10-2002).

Between 1925 until 1951, 12 streamflow maintenance dams, 3 lake level dams and 3 meadow maintenance dams were built in the Emigrant Wilderness The creation of these dams and the subsequent stocking of fish into an ecosystem naturally void of fish resulted in the loss and creation of meadow habitat for the YT and increased predation on the MYLF. It should be noted that declining amphibian populations are not unique to the Emigrant Wilderness, but are global in scale and are thought to be a combination of human-made and natural causes, such as pesticides, acid rain, increases in ultraviolet radiation, habitat destruction and viruses. The repair and maintenance of dams cumulatively would not contribute to additional loses to any species.

FISH

Historically, nearly all lakes above 6,000 feet in the Sierra Nevada mountain range were fishless. Since the 1870s, most of the high elevation lakes in California (primarily in the Sierra Nevada range) capable of supporting fish have been stocked with trout. Four species of trout are now found within the Emigrant Wilderness: rainbow trout (Oncorhyncus mykiss), Eastern brook trout (Salvelinus fontinalis), brown trout (Salmo trutta), and golden trout (Oncorhyncus mykiss aguabonita). Of these species, rainbow trout and brook trout occur within the project area.

Trout are stocked by California Department of Fish and Game (CDFG) within the Emigrant Wilderness project area. Although fish stocking is outside the scope of this analysis, data from Yosemite National Park indicate that fish populations could persist in many of the Emigrant lakes without stocking. Yosemite is on the southern border of the Emigrant, and is similar in elevation, geology, and snow pack dominated spring runoff.

The spinytail fairy shrimp (*Streptocephalus* sealii), native and common to California and many other states, is present in Y-Meadow Lake.

The release of water from an impoundment increases streamflow and recharges downstream lakes, but during dry periods of the year, there is a gradual reduction in the size of impounded lake rearing habitat. The effects to fish from the management alternatives are analyzed relative to the existing situation. For most lakes, the existing condition is that leakage and/or unregulated release of water through a valve gradually meters out water. During dry months, the lakes are gradually drawn down then refill during wet months. Since lake levels are dependent on annual precipitation and runoff, in addition to leakage or release of impounded water, the effects to fish populations from impoundments must be analyzed in relative terms.

Dams may interrupt movement of fish and other aquatic organisms. In naturally fragmented habitat such as that which occurs in many steep areas of the Sierras, upstream movement of aquatic organisms is limited. Where stream gradients are low to moderate, there may be seasonal upstream movements to feed, spawn, seek cool water (thermal shelter), avoid entrapment in a drying bed, avoid predators, etc. Carrying capacity gained by impounded water or surface acreage may be partially offset by losses due to habitat fragmentation by damming.

Fish populations are likely to persist under each alternative through either self-sustaining reproduction or ongoing CDFG fish stocking.

Loss of carrying capacity or spawning success due to changes in water discharge on streamflow maintenance dams may prompt CDFG to increase stocking to maintain fishing opportunities. It is expected that Alternative 1 would maintain or improve existing fisheries and obviate the need for a change in stocking practices.

Y-Meadow Lake has no fisheries resource, but it would lose rearing area for fairy shrimp if the dam is allowed to deteriorate over the long term.

Release of impounded water may draw down some impoundments more than occurs under existing conditions. This would be particularly true of Long Lake, Lower Buck, High Emigrant, Snow Lake, and Bigelow that would not be recharged from upstream releases. Those lakes could see a decline in available fish rearing habitat during dry periods.

BOTANY

No federally listed threatened or endangered plants could occur in this project. Of the 25 Region 5 designated sensitive plant species for the Stanislaus National Forest, 7 fall within the elevation range and habitats that could be affected by the Emigrant Dams. These are: Bruchia bolanderi, Epilobium howellii, Hulsea brevifolia, Hydrothyria venosa, Meesia triquetra, M. uliginosa, and Orthotrichum spjutii. Three additional plants on the Region 5 sensitive species list were also considered in this analysis. Two of these species,

Botrychium ascendens and B. crenulatum, are moonworts that were not originally included for the Stanislaus National Forest. One of these species, Hydrothyria venosa, is very unlikely due to the relative large flows and snowmelt scour that occurs in the streams below the dams. Hydrothyria venosa grows very slowly and is unable to survive where there is heavy scour. See Table S-2 for Summary of Effects.

SOCIAL AND ECONOMIC

In 2002, almost 66,000 Recreation Visitor Days (RVDs) were estimated to occur in the Emigrant Wilderness. The most recent data available regarding the origin of visitors to the Wilderness was compiled as percentage of total use from 1991-1994 (Emigrant Wilderness Management Plan, 1998, p. 189). 10% of visitors came from outside the state, 9.5% came from four local counties, 16% came from neighboring counties, and over half came from the San Francisco Bay area. In terms of overnight use, approximately 31% was estimated to occur in dam/lake areas. Data on the origin of visitors who specifically visited the dammed lakes is not available. Further, no data is available on the socio-economic characteristics of Emigrant visitors.

Most of the tourism related expenditures associated with recreating in the Emigrant occur within the four local counties of Tuolumne, Calaveras, Alpine and Mariposa, which for the purpose of this project will be called the Emigrant region. Many residents from the four local counties recreate in the Emigrant. While local hikers and backpackers account for a larger percentage of the total number of visitors, local users account for almost a quarter of the private stock (horse packing) visitors to the wilderness.

Alternative 2, in which all the dams would be allowed to deteriorate, has the largest potential to reduce recreational values associated with fishing opportunities at the dam/lake areas. Alternative 3 has the next highest potential to reduce recreational fishing values, while Alternative 1 would likely result in the least impact to recreational fishing values. (Short-term impacts to recreational fishing values would occur during the reconstruction, repair, and maintenance of the dams under Alternatives 1 and 3).

For recreational visitors who do not fish, recreation values would likely be reduced most in the short-term under Alternative 1 due to increased activity at the dam/lake areas during the periods of dam reconstruction, repair, and maintenance. For recreational users whose values are closely tied to the scenic integrity of the dam/lake areas they visit, Alternative 2, in which all of the dams are allowed to deteriorate naturally, has the largest potential to increase scenic integrity in the long term.

ADMINISTRATIVE COSTS

As stated in Section 2.3, the implementation of the Proposed Action (or Alternative 3) would be dependent upon the use of non-appropriated funding. Implementation would be completed with volunteers, partnerships, memorandum of agreements, etc., including materials, stock support, and labor. In addition to the implementation costs, it is estimated that some cost to government would occur for coordination, mitigation, and monitoring of project activities. The total estimated cost, for each dam, would be $2,755[1]. There is also a cost to maintain the administrative records, complete on-site inspections[2], and write reports.

[1] This amount is an average, as costs could be higher or lower for any given project depending on the complexity of the project and the location of the site.
[2] Every 3-5 years depending on the dam's administrative classification and hazard rating (Wisehart 2003).

This cost is estimated to be $5,000 annually. Since all the dams would continue to be inspected until they no longer impounded water, (regardless of whether they are maintained or not maintained) there would be no noticeable change between the alternatives. Although a few of the dams would stop functioning in less than 10 years, the majority may continue impounding water for 25-50 years (up to 100 years for Y-Meadow).

SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

UNAVOIDABLE ADVERSE EFFECTS

As described in Chapter 3, there are no unavoidable adverse effects.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forest areas that are kept clear for use as a power line rights-of-way or road. There would be an irretrievable loss of 18 acres of existing meadow habitat at Cow Meadow dam in Alternative 1. In this alternative, the dam would be reconstructed. The long-term effect of non-maintenance and natural deterioration of the seven NRHP eligible dams would be the irreversible loss of representative examples of Fred Leighton's contributions to early fisheries improvements. The original meadow habitat that was inundated by Y-Meadow dam is irreversible due to sediment deposit in the lakebed.